

The Honorable Shana Dale
NASA Deputy Administrator
National Association of Women Business Owners
Silicon Valley Chapter
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Thank you for that kind introduction James.

I'd also like to recognize Ms. Ceil McCloy; NAWBO President; Carla Cobb Davis (CEO of DBC Groups, Inc.); and Marilyn Ritter, NAWBO's Program Director.

It's a pleasure to be here with all of you, especially today's awardee.

We've much to celebrate today: an individual who has gone the extra mile and who has risen to great heights. I applaud your success and achievement.

We also have much to celebrate with America's space program. This year marks NASA's 50th year of achievement as an agency. There's far more to it than simply the passage of time. Like today's awardee – whose success has inspired and lifted many others – NASA's 50 years have brought real benefits to business owners across this state and this nation. And the best part is that we're just getting started. NASA is opening new worlds of opportunity, and I hope each of you will be a part of it.

I would like to note that as a federal agency, NASA has made a determined effort to invite more women business owners into our programs, especially through our Office of Small Business Programs. You might want to check out the website, www.osbp.nasa.gov, or ask me later how to get in touch with Glenn Delgado, the Assistant Administrator for the Office of Small Business Programs.

Our Small Business Office also has the Mentor-Protégé Program which is designed to incentivize NASA prime contractors to assist small disadvantaged business (SDB) concerns, Historically Black Colleges and Universities (HBCUs), minority institutions (MIs), and women-owned small business (WOSB) concerns.

The Mentor-Protégé Program helped Ms. Nikki Olyai as president of Innovision Technologies, an advanced sciences, engineering, and information technology firm. Innovision Technologies worked closely with the NASA Jet Propulsion Laboratory on our Deep Space Network, which is our means of communications with our space missions. We are thrilled that companies like Innovision Technologies, and many others like it, have taken advantage of the small business programs offered at NASA.

Some of you remember when we landed on the Moon or you have seen a space shuttle launch or landing, and many of you have seen images from the Hubble Space Telescope or images from our little rovers on Mars. Those are some of our most visual accomplishments -- the culmination of excellent efforts by tens of thousands of people.

But there are less visible achievements as well, like creating the key technological breakthroughs that fuel local economies and keep our nation competitive. You may have heard of NASA spin-offs: specific technologies the agency has developed for our missions that the private sector has then picked up and refined or transformed for commercial use. There are over 1,500 documented NASA-derived technologies, ranging from better cancer detection methods to robots that clear caves and cross minefields in Iraq and Afghanistan in advance of our soldiers and Marines.

These NASA-derived technologies, the invisible essentials of space, like the visible essentials of space – rockets and satellites – are all part of the Space Economy. The Space Economy consists of space-related products and services, as well as the new markets and possibilities for economic growth that space exploration encourages.

And it encompasses the full range of activities that create and provide value to human beings in the course of exploring, understanding and utilizing space. The Space Economy impacts just about every aspect of how we live, work, and play.

When we pay for gas at the pump, draw cash from an ATM, or listen to satellite radio, we can experience the benefits of the Space Economy. Space exploration has created new markets and new technologies that have powered our economy and changed our lives in many ways.

According to the 2007 Space Foundation report, the Space Economy generates \$220 billion in total revenues worldwide, with the promise of new exciting markets including a nascent space tourism industry and the development of space logistics services that will further transform space into an even more robust commercial enterprise.

So, while the commercialization of space for new emerging markets is just around the corner, the Space Economy has already arrived and is thriving in our communities.

You can find NASA-driven technologies just about anywhere you look. Take, for instance, your doctor's office. Breast biopsies are critical for the detection and treatment of breast cancers. And thanks to high resolution, real time imaging technology derived from the Hubble Space Telescope program, breast biopsies can be performed with a needle instead of a scalpel. The needle biopsies leave only a small mark instead of a large scar, cost significantly less than traditional biopsies, and can be performed in a doctor's office as opposed to an operating room.

Critically-ill heart patients waiting for heart transplants are now being kept alive by implanted heart pumps developed by engineers from the Johnson Space Center in Houston, Texas, and supercomputer experts from the Ames Research Center in Mountain View, California. The team analyzed blood flow through the heart pump using the same methodologies we've been employing to analyze fuel and oxidizer flow through rocket engines. To date, more than 400 of these extraordinary heart pumps have been implanted in people worldwide, giving them a second chance at life.

Water recycling and filtration systems engineered to sustain astronauts living on the International Space Station have been adapted to provide safe, affordable drinking water in poor and remote regions where clean water can mean the difference between life and death.

NASA technologies can help ensure that water gets where it is most needed in other ways as well. When terrible blazes raged across Southern California last fall, NASA's Earth-observing satellites helped monitor their spread. We also sent an unmanned aerial vehicle equipped with thermal-infrared sensors and sophisticated real-time transmission equipment over the fires. The Ikhana aircraft peered through heavy smoke and darkness and found hot spots and flames. It then transmitted the information to the National Interagency Fire Center which distributed the imagery to fire incident commanders over the Internet. These commanders were able to use this information from NASA and deploy firefighters real-time to the most vital locations.

These are only a few examples of how NASA technologies are contributing to the Space Economy for all of us here on Earth, but it is by no means an exhaustive list.

The point is that technology advancement doesn't recognize boundaries. The same capabilities that apply "out there" in space also apply directly to our most critical needs back here, on Earth. The advances NASA makes are then refined, adapted or transformed to meet the challenges we face here, from heart pumps to advanced breast cancer imaging to compact water filtration systems.

NASA-derived discoveries also lead to sustainability of our planet and its natural resources. In fact, sustainability of our Earth permeates NASA's missions.

For example, to survive on the Moon's surface, we must find ways to create, collect, store and use energy without access to fossil fuels. Other sources of energy must be developed into practical resources that humans can use in extreme environments.

As we continue to explore new sources of energy and delivery methods, these efforts can help to address the pressing demand for energy right here on Earth. Space exploration demands cleaner and more efficient sources of energy that can operate in extreme environments without toxic effects.

One example of a relatively clean energy source offering tremendous potential is solar power. NASA pioneered the use of solar cells in the Apollo Program and continues to push the limits of this technology today, with the solar "wings" that collect the sun's energy for use onboard the International Space Station.

The potential impact of developing alternative, clean energy sources, already being explored by NASA, is so great that we can hardly imagine it, affecting the lives of not only Americans, but of every person on the face of the planet.

In addition to renewable energy sources, space exploration contributes to sustainability in many other ways. A unique example of using NASA funding to potentially better our environment is a business spin-off called Endpoint Environmental which specializes in building maps with proprietary algorithms that extract specific information from satellite or aerial imagery. Endpoint Environmental was founded in 2005 by Catherine Burton. Ms. Burton worked at NASA Ames Research Center as a Project Manager of student interns who initially developed this geospatial technology. Currently, the company is focusing on global environmental remediation. Some examples are identifying the location and size of tire piles, which are environmental threats, as well as the location and density of non-native species, both animals and plants.

We are excited to see NASA-derived technologies such as these that will ultimately help our environment.

There are constraints we encounter in space exploration that push sustainability-related technologies. In space travel, physical space is limited, weight is critical, and resources are severely constrained.

Every watt of energy is accounted for; every resource is transported and monitored. Space exploration drives the development of technologies with minimal impact to these tiny ecologies – and, by extension, to the ecology of Planet Earth.

These technologies include advanced recycling techniques, treating waste and converting it back into usable resources, as well as new, green power systems.

Outposts on the Moon, as well as travel to Mars, will require lighter materials, manufacturing techniques with little waste or pollution, and even better methods of recycling and reuse, contributing to the development of sustainable systems on our own world.

But perhaps NASA's biggest contribution to sustainability is the development and operation of Earth-observing satellites. NASA satellites supply more global climate change data than those of any other organization in the world. It is only through NASA's investments in measuring the forces and effects of climate change that we have such insights and understand its implications to our home planet.

Based on NASA satellite data, we have not only seen the receding ice sheets of Greenland and Antarctica, but have quantitatively measured how fast these ice sheets are melting. NASA scientists have observed the smallest Arctic sea ice coverage ever recorded in 2007, and when comparing that ice coverage for the months of September over the past two years, the loss of sea ice exceeds the combined geographical areas of California and Texas. Using satellite altimetry, we have recorded rising global sea levels in excess of 3.2 millimeters per year over the past decade, with approximately half of that increase due to this sea ice melting and the other half due to thermal expansion as the ocean absorbs more heat. In regards to nitrogen oxide emissions, one of the greenhouse

gases that form smog, NASA sensors helped researchers document their doubling in Asia from 2000 to 2006.

NASA has fourteen Earth-observing satellites in orbit today. Another seven Earth science missions are under development, three of which will launch over the next 12 months. And, as of two weeks ago when NASA released the FY2009 budget request, we have initiated five more Earth science missions for launch by 2020. All in all, NASA invests about \$1.5 billion every year in Earth Science.

NASA also provides specific benefits to California and Silicon Valley.

Silicon Valley is home to NASA's Ames Research Center. Ames also soon will be home to NASA's new Lunar Science Institute, which will advance our human exploration efforts on the Moon. I'll say more about those efforts in a few minutes, but I hope you'll keep in mind that these are actual plans, and real programs. The Lunar Science Institute is expected to begin its operations next month, and the vehicles we'll need to return to the Moon are moving from blueprints to testing stands.

California companies will benefit from those efforts, since in addition to Ames, NASA has two other centers in the state: Dryden Flight Research Center, located near Palmdale, and the Jet Propulsion Laboratory in Pasadena.

Last year, NASA obligated over \$3 billion in the state. Funding went to NASA's three California Centers, to contracts with many California-based companies, and grants to California academic institutions. Additionally, California hosts a robust space entrepreneurial industry.

Those investments, as well as our efforts in areas like Earth and space science and fundamental aeronautics research, are all helping our high tech industries stay on the cutting edge of competitiveness and thereby driving U.S. economy growth.

These many benefits are important. But NASA's primary mission is exploring space. And this is one of the most exciting times to be at the agency, since we have a space exploration mission that is grand in its vision and will span generations into the future.

Our journey to the Moon by 2020 will be fundamentally different than the days of Apollo. The astronauts of the Apollo era were limited to landing in the equatorial region of the Moon and they stayed for only three days at a time. We are planning on developing an outpost with many other countries and eventually living on the surface of another world, the Moon, for up to six months at a time. The capabilities demonstrated by constructing a habitat, developing advanced rovers for humans, and mining resources from the lunar soil will be absolutely critical to moving further out into our Solar System. I am often asked, "why the Moon?" If there is an emergency on the surface of the Moon, the return to Earth will take three days. A return from Mars will take 180 to 250 days after you wait for Mars and the Earth to be in the required relative positions. That could

take as much as 500 days to wait for the opportunity. As you can see, astronauts will have to be totally reliant upon themselves. There is no quick return to Earth from Mars.

Work has begun on the spacecraft that will take us on the next steps outward: the rockets and the crew exploration vehicle. This entire program that will take us to the Moon, Mars and beyond – the spacecraft, the rockets, the rovers, and the habitat – everything falls under the program name of Constellation much like Apollo referred to the entire Moon program. Last year, we awarded all the major contracts for the launch vehicle and the crew vehicle. Components for those craft are coming together. They are going from blueprints to models to tests. And we're planning on doing all of this for far less than the budget you might expect.

A recent survey showed that many people think NASA is nearly as well-funded as the Department of Defense. NASA receives far less.

Today, all of our investments in the Space Shuttle program, the International Space Station, future human explorations, aeronautics research, and our science endeavors are happening on a budget with a funding level that is less than six-tenths of one percent of the federal budget.

Because of those budget realities, it will take time to make our new program happen. A gap of almost five years is expected between the retirement of the space shuttles and the launch of the new vehicles. They will come on line in 2015, and our landings on the Moon are expected around 2020.

But making the new programs happen will require more than steady streams of funding, and even more than scientific expertise and engineering excellence. Taking the next steps outward will require willpower, determination, and enduring drive – the kind of traits that have opened new worlds of opportunity for us and will open literally new worlds for future generations.

I hope many of you will have a part as well, as contractors, suppliers, mentors, and as citizens who cheer on America's space program.

Eric Schmidt, Google Chairman of the Board and CEO, recently came to Washington, DC, as the featured speaker of the NASA Lecture Series. During his talk, he said that "Google and NASA are similar in that they are based on optimism." I'm paraphrasing his comments, but basically he said, you have to be optimistic to want to take on the exceedingly difficult task, some would say impossible task, of building the International Space Station, sending a man or woman to the Moon, to Mars, and to places beyond. And you have to be an optimist to want to build a global network that covers all of the world's information. But we're both doing it. His point is clear and relevant to all of us in this room. Without these hopes and dreams, and yes, optimism, we may forsake great achievements. Without hopes and dreams, we leave potential on the floor. It is through these dreams and the efforts to realize them that we create new opportunities for success and scale to new heights that not too long ago seemed out of reach.

I'd like to relate a recent event that demonstrates how far we have come. It took place last October in the form of a simple handshake. Many of you might have seen that simple handshake -- it was also an extraordinary one, one with profoundly optimistic implications for all of us as women.

For one thing, the handshake took place in space while orbiting the Earth at a speed of 17,500 miles per hour. And it was between two women: Pam Melroy, the commander of the space shuttle Discovery, and Peggy Whitson, the commander of Expedition 16, the crew aboard the International Space Station. When the hatch between the Space Shuttle and the International Space Station was opened, their handshake marked the first time in NASA's history that there has been a female commander of both the shuttle and the space station at the same time.

I believe it says a lot about the power of hopes and dreams and the great things that can come from them -- for women, for our nation, and for our world.

Thank you.